

NOTE

Variation in Abdominal *sa2* and *sa3* Setation in Larvae of *Arctopsyche grandis* (Banks)
(Trichoptera: Hydropsychidae)

Arctopsyche grandis (Banks) is the most abundant and widespread of the western Nearctic arctopsychine caddisflies, and the larvae are often collected in streams from 45–2,150 m in elevation (Givens and Smith 1980). Wiggins (1996) separated known larvae of *Arctopsyche* from larvae of the genus *Parapsyche* by the setation of the abdominal *sa2* and *sa3* positions. *Parapsyche* species bear a tuft of several long setae or scale hairs in each position, whereas *Arctopsyche* species bear a single, long, hair-like seta in each position, occasionally accompanied by one or two shorter setae.

To quantify the extent of variation in the abdominal setation in *A. grandis*, I examined larvae from four Rocky Mountain rivers: the Clark Fork River in Montana, the

Arkansas and Eagle rivers in Colorado, and the Red River in New Mexico. Benthic macroinvertebrate samples for ecological studies had been taken from 1994 to 1996 at 8–14 individual sites in each river. A total of 660 *A. grandis* larvae were examined, and the number of setae in each of the *sa2* and *sa3* positions of abdominal segments I–VII was counted. The geometric mean number of setae per position was calculated, and these data were analyzed by general linear methods analysis of variance (GLM-ANOVA) using NCSS (Number Cruncher Statistical Systems 1997) to determine if statistical differences existed in setation between abdominal segments, setal positions, or river systems. A 95% significance level ($\alpha = 0.05$) was used for all tests.

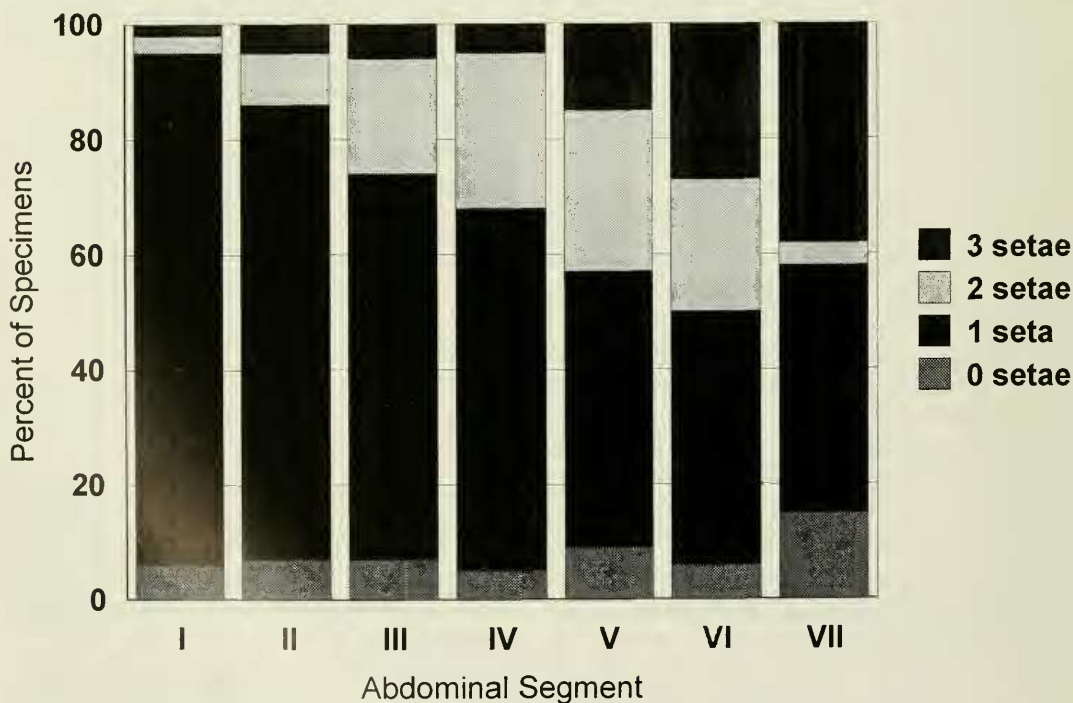


Fig. 1. Number of setae in *sa2* position on abdominal segments of *Arctopsyche grandis* ($n = 660$).

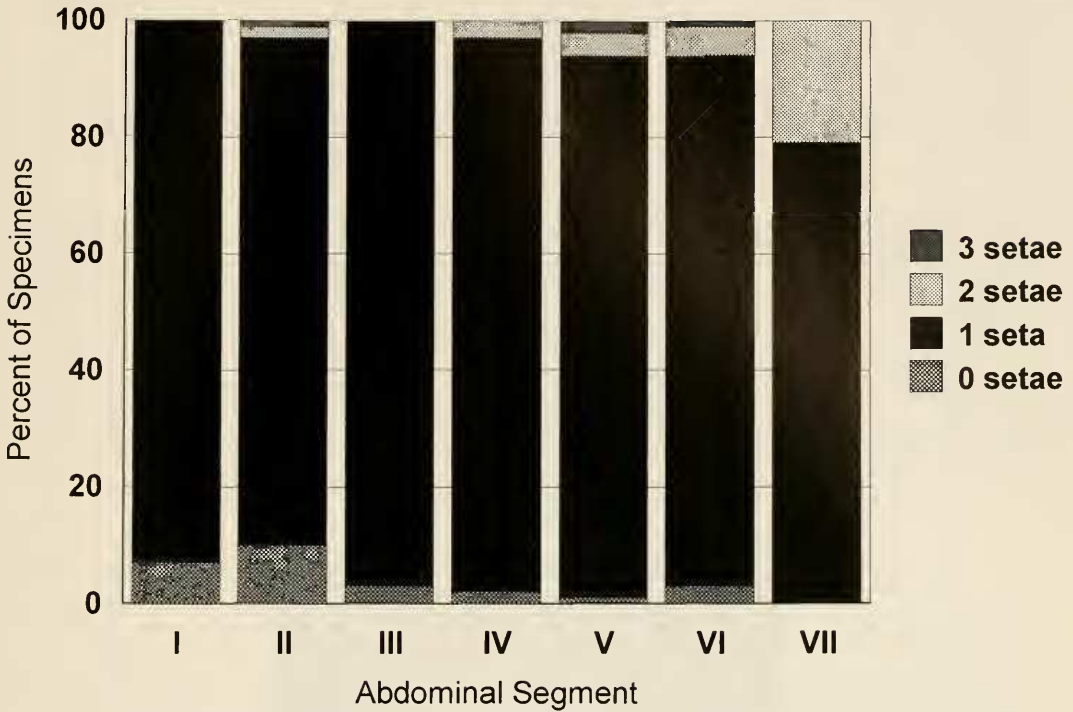


Fig. 2. Number of setae in *sa3* position on abdominal segments of *Arctopsyche grandis* ($n = 660$).

Number of setae ranged from 0–3, and most positions were occupied by only one seta (Figs. 1, 2). The *sa2* positions were significantly more likely to have 0, 2, or 3 setae than the *sa3* positions ($P < 0.001$; $F = 21.79$; $df = 4,51$), and ANOVA demonstrated significant differences ($P < 0.05$) between positions in each of abdominal segments II–VI. Posterior abdominal segments (IV–VII) were significantly more variable in numbers of setae than anterior abdominal segments (I–III) in both *sa2* ($P = 0.013$; $F = 3.61$, $df = 4,23$) and *sa3* ($P < 0.001$; $F = 8.11$; $df = 4,23$) positions. When 2 or 3 setae were found in a single position, one was usually of normal length and the extra setae were always reduced in size. All setae in all positions were hairlike. There were no significant differences observed between setation of larvae from the four individual river systems ($P = 0.851$; $F = 0.26$; $df = 4,23$).

This report confirms Wiggins' (1996) observations on the number and form of setae in the abdominal *sa2* and *sa3* positions in *A. grandis* larvae, but further identifies and quantifies between-segment and between-position variation not previously noted.

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